STATEMENT OF BASIS Minor Air Quality Permit Persona, Inc. Madison, South Dakota

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1.0 BACKGROUND

Persona, Inc., in Madison, South Dakota, manufactures channel letter signs using aluminum channels and neon tubes. A plasma arc cutting machine is used to cut sheets of metal, which are shaped into signs and letters. The pieces are spot-welded, braced, and then etched with a phosphate solution prior to painting. Neon tubes, electrical parts, and the sign faces are installed completing the assembly. Persona also manufactures steel and aluminum sign frames illuminated with fluorescent lamps. The frames are fabricated from aluminum extrusions or sheet metal that is sheared, bent, and welded together. The pieces are then etched using a phosphate solution and painted. Final assembly includes installing the sign face. The primary Standard Industrial Classification (SIC) code is 3993 – Miscellaneous Manufacturing Industries – Signs and Advertising Specialties.

Persona initially submitted an application for a minor air quality permit for the facility in Madison on April 16, 2002. At that time only one paint booth was in operation and the facility was notified on February 13, 2003, that the potential emissions from the paint booth were below the threshold required for permitting. Persona submitted a new application for a minor air quality permit on March 28, 2006. The permit application indicates that the facility currently operates three paint booths and required a minor air quality permit.

On June 5, 2012, Persona submitted a minor air quality permit renewal application. The application was considered complete on September 28, 2012.

1.1 Existing Equipment

Table 1.1 provides a description of the existing permitted equipment at Persona's facility in Madison, as outlined in Persona's November 16, 2006, minor air quality permit.

Table 1-1 – Description of Permitted Units, Operations, and Processes

		Maximum	Control
Unit	Description	Operating Rate	Device
#1	1997 PMD Large Frames Paint Booth, Model M&W 36 CFDT.	Not applicable	Not applicable
#2	1997 PMD Small Frames Paint Booth, Model M&W 30 CFDT.	Not applicable	Not applicable
#3	PMD Channel Letters Paint Booth, make and model unknown.	Not applicable	Not applicable

2.0 New Source Performance Standards

There are no New Source Performance Standards that are applicable to Persona's operations.

3.0 New Source Review

ARSD 74:36:10:01 states that New Source Review (NSR) regulations apply to areas of the state which are designated as nonattainment pursuant to the Clean Air Act for any pollutant regulated under the Clean Air Act. Persona is located in Madison, South Dakota, which is in attainment or

unclassifiable for all the pollutants regulated under the Clean Air Act. Therefore, Persona is not subject to NSR review.

4.0 Prevention of Significant Deterioration

A prevention of significant deterioration (PSD) review applies to new major stationary sources and major modifications to existing major stationary sources in areas designated as attainment under Section 107 of the Clean Air Act for any regulated air pollutant. The following is a list of regulated air pollutants under the PSD program:

- 1. Total suspended particulate (PM);
- 2. Particulate with a diameter less than or equal to 10 microns (PM10);
- 3. Particulate with a diameter less than or equal to 2.5 microns (PM2.5);
- 4. Sulfur dioxide (SO₂);
- 5. Nitrogen oxides (NOx);
- 6. Carbon monoxide (CO);
- 7. Ozone measured as volatile organic compounds (VOCs);
- 8. Lead:
- 9. Fluorides
- 10. Sulfuric acid mist;
- 11. Hydrogen sulfide;
- 12. Reduced sulfur compounds;
- 13. Total reduced sulfur; and
- 14. Greenhouse gases (carbon dioxide, methane, nitrous oxide, etc.).

If the source is considered one of the 28 named PSD source categories listed in Section 169 of the federal Clean Air Act, the major source threshold is 100 tons per year of any regulated air pollutant, except for greenhouse gases. The major source threshold for all other sources is 250 tons per year of any regulated air pollutant, except for greenhouse gases.

Persona in Madison, South Dakota is not one of the 28 listed source categories for PSD regulations and the major source threshold is 250 tons per year, except for greenhouse gases.

According to the Clean Air Act, once a pollutant is regulated under any part of the Act, (as was the case with greenhouse gas emissions after the motor vehicle regulations were finalized in March 2010) major new sources or major modifications are subject to the PSD program and Title V air quality operating permit program. Under the Clean Air Act, PSD and Title V air quality operating permits are required for all sources that emit a regulated air pollutant above 100 or 250 tons per year, depending on the source. This threshold, if applied to greenhouse gases, would greatly increase the number of facilities requiring a PSD review or Title V air quality operating permit. Based on administrative necessity, EPA increased these thresholds through the "Tailoring Rule."

On May 13, 2010, EPA issued the final version of the "Tailoring Rule" for greenhouse gas emissions. The major source threshold for greenhouse gases is listed below:

1. New PSD source because of a criteria air pollutant, the major source threshold for greenhouse gases is 75,000 tons per year of carbon dioxide equivalent or more;

- 2. New PSD source if greenhouse gas emissions are 100,000 tons per year of carbon dioxide equivalent or more;
- 3. For an existing PSD source because of a criteria air pollutant, a major modification for greenhouse gases is an increase of 75,000 tons per year of carbon dioxide equivalent or more;
- 4. For an existing non-PSD source that has the potential to emit 100,000 tons per year of carbon dioxide equivalent emissions or more, a major modification for greenhouse gases is an increase of 75,000 tons per year of carbon dioxide equivalent or more; and
- 5. In addition to subsection (2) and (4), a specific greenhouse gas, without calculating the carbon dioxide equivalent, also needs to emit greater than 100 or 250 tons per year, whichever is applicable, to be regulated.

Physical or operational limits on the operating capacity or emissions rate of a unit, including pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, are included in the potential emission calculations if the limitation is enforceable.

4.1 Potential Emissions

The emission factors were derived from the material safety data sheets for the products used in the paint booths. The potential emission rate will be estimated from the amount of paint and solvent used and the amount of time the booths are operated. Uncontrolled potential emissions are those that would occur with no emission controls. Dry filter media are used to control particulate matter; however, the filters do not control volatile organic compound (VOC).

Persona stated in the application that Units #1 and #2 each operate 16 hours per day, 252 days per year for a total of 4,032 hours per year. Unit #3 operates 8 hours per day, 252 days per year or 2,016 hours per year. Potential emissions are calculated assuming that the facility operates 24 hours per day, 365 days per year (8,760 hours per year). Persona does not keep records of the amount of material used in each paint booth. However, in a letter received October 10, 2012, Persona provided an estimate of the amount of material used in each booth by estimating the spray time and type of product used in each spray booth. Persona estimated that 56% of the paint was used in Unit #1, 17% in Unit #2, and 28% in Unit #3.

The potential emissions for Unit #1 and #2 will be calculated by multiplying the actual emissions by the following ratio:

• Multiplying ratio =
$$\frac{8,760}{4,032} \frac{potential\ operating\ hours/year}{actual\ operating\ hours/year} = 2.17$$

The potential emissions for Units #3 will be calculated by multiplying the actual emissions by the following ratio:

• Multiplying ratio =
$$\frac{8,760}{2,016} \frac{potentialo\ peratinghours\ /\ year}{actual operatinghours\ /\ year} = 4.35$$

The actual VOC calculations for the facility are given in the application - 12.4 tons per year. The potential emissions will be estimated based on the multiplying ratio for each paint booth and the estimated amount of material sprayed in each booth.

The potential emissions for each paint booth are calculated using the following equations:

Equation 4-1: Unit #1 – Large Frames Paint Booth

• VOC =
$$0.56 \times \frac{12.4 tonsactual VOC}{yr} \times 2.17 = 15.1 tons/yr$$

Equation 4-2: Unit #2 – Small Frames Paint Booth

• VOC =
$$0.17 \times \frac{12.4 tonsactual VOC}{vr} \times 2.17 = 4.6 tons/yr$$

Equation 4-3: Unit #3 – Channel Letters Paint Booth

• VOC =
$$0.28 \times \frac{12.4 tonsactual VOC}{yr} \times 4.35 = 15.1 tons/yr$$

4.2 POTENTIAL EMISSIONS SUMMARY

Potential emissions for each applicable pollutant are calculated by assuming the unit operates every day of the year at the maximum design capacity. The potential uncontrolled emissions are summarized in Table #4-1.

Table #4-1: Summary of Potential Uncontrolled Emissions

Process	VOCs, tons/year
Unit #1 – Large Frames Booth	15.1
Unit #2 – Small Frames Booth	4.6
Unit #3 – Channel Letters Booth	15.1
Total Potential Emissions	34.8

4.3 Potential to Emit for Greenhouse Gases

Persona is not one of the 28 named facilities; therefore its criteria pollutant threshold is 250 tons per year. Based on the emission estimates noted in Table 4-1, Persona is considered a minor source for the criteria pollutants and not applicable to the PSD program. In regards to greenhouse gas emissions, Persona is considered an existing non-PSD source. Persona's painting operations do not generate greenhouse gas emissions. Persona's potential greenhouse emissions are considered negligible and does not have the potential to emit greater than 100,000 tons per year and is not applicable to the PSD program.

5.0 National Emission Standards for Hazardous Air Pollutants

There are no NESHAP standards that are applicable to Persona's operations.

6.0 Maximum Achievable Control Technology Standards

The federal Maximum Achievable Control Technology Standards are applicable to both major and area sources of hazardous air pollutants. A major source of hazardous air pollutants is defined as having the potential to emit 10 tons or more per year of a single hazardous air pollutant or 25 tons per year or more of a combination of hazardous air pollutants. An area source is a source that is not a major source of hazardous air pollutants.

6.1 Potential HAP Emissions

Using the same conditions outlined in Chapter 4, the potential HAP emission can be calculated. The actual HAPs calculations for the facility are given in the application -2.6 tons per year.

The potential emissions for each paint booth are calculated using the following equations:

Equation 6-1: Unit #1 – Large Frames Paint Booth

• HAP =
$$0.56 \times \frac{2.6 \text{ tons actual HAP}}{\text{year}} \times 2.17 = 3.2 \text{ tons/yr}$$

Equation 6-2: Unit #2 – Small Frames Paint Booth

• HAP =
$$0.17 \times \frac{2.6 \text{ tons actual } HAP}{\text{year}} \times 2.17 = 1.0 \text{ tons/yr}$$

Equation 6-3: Unit #3 – Channel Letters Paint Booth

• HAP =
$$0.28 \times \frac{2.6 \text{ tons actua } HAP}{\text{year}} \times 4.35 = 3.2 \text{ tons/yr}$$

Table #6-1: Summary of Potential Uncontrolled Emissions

Process	HAPs, tons/yr
Unit #1 – Large Frames Booth	3.2
Unit #2 – Small Frames Booth	1.0
Unit #3 – Channel Letters Booth	3.2
Total Potential Emissions	7.4

Xylene is the hazardous air pollutants emitted in the largest quantities at 1.2 tons per year. The potential emissions of xylene are 3.4 tons per year, which is below the major source threshold of 10 tons per year for a single hazardous air pollutant. The total potential hazardous air pollutant emissions are 7.4 tons per year, which is below the 25 tons per year major source threshold for a combination of hazardous air pollutants.

6.2 Other MACT Standards

The department reviewed the maximum achievable control technology (MACT) standards and determined that the following may be applicable.

6.2.1 40 CFR Part 63, Subpart MMMM

40 CFR Part 63, Subpart MMMM is subject to owners or operators of miscellaneous metal parts and product surface coating facilities located at a major source of hazardous air pollutants.

Persona is not a major source of hazardous air pollutants. Therefore, the operations at the facility are not subject to this Maximum Achievable Control Technology standard.

6.2.2 ARSD 74:36:08: 40 CFR Part 63, Subpart HHHHHH

40 CFR Part 63, Subpart HHHHHHH, the National Emission Standards for Paint Stripping and Miscellaneous Surface Coating Operations, is applicable to area sources that engage in any of the following:

- 1) Paint stripping operations that use Methylene Chloride (MeCl)- containing paint stripping formulations;
- 2) Spray application of coatings to motor vehicles and mobile equipment
- 3) Spray application of coatings to a plastic and/or metal substrate where the coatings contain compounds of Chromium (Cr), Lead (Pb), Manganese (Mn), Nickel (Ni), or Cadmium (Cd).

Persona does not use methylene chloride for any paint stripping operations. The Material Safety Data Sheets submitted by Persona for the various paints and coatings indicate that the paints and coatings do not contain compounds of chromium, lead, manganese, nickel, or cadmium. Persona does not apply coatings to motor vehicles or mobile equipment. Therefore, Persona is not subject to this subpart.

6.2.3 ARSD 74:36:08:119 – 40 CFR Part 63, Subpart XXXXXX

40 CFR Part 63, Subpart XXXXXX is applicable to owners or operators for the control of hazardous air pollutants for nine metal fabrication and finishing area source categories. The provisions of this subpart are applicable to an area source that is primarily engaged in the operations in one of the following nine source categories:

- 1. Electrical and Electronic Equipment Finishing Operations (NAICS codes 335999 and 335312);
- 2. Fabricated Metal Products (NAICS codes 332117 and 332999);
- 3. Fabricated Plate Work (Boiler Shops) (NAICS codes 332313, 332410, and 332420);
- 4. Fabricated Structural Metal Manufacturing (NAICS code 332312);
- 5. Heating Equipment, except Electric ((NAICS code 333414);
- 6. Industrial Machinery and Equipment Finishing Operations (NAICS codes 333120, 333132 and 333911);
- 7. Iron and Steel Forging (NAICS code 33211);
- 8. Primary Metal products Manufacturing (NAICS code 332618); and
- 9. Valves and Pipe Fittings (NAICS code 332919).

Persona has a Standard Industrial Classification Code of 3993 and a North American Industry Classification System code of 339950. Persona is not one of the nine operations applicable to this subpart. Therefore, Persona is not applicable to this subpart.

7.0 State Requirements

7.1 Permit Type

According to ARSD 74:36:05:03, a facility is required to obtain a minor air quality operating permit if the source has the potential to emit more than 100 tons of a criteria pollutant (nitrogen oxide, volatile organic compounds, PM10, carbon monoxide, lead and ozone), has the potential to emit more than 10 tons of a single hazardous air pollutant, has the potential to emit more than 25 tons of any combination of a hazardous air pollutants, or is applicable to a New Source Performance Standard or a MACT standard. Based on the potential emissions, Persona is not considered a major source.

Any source operating in South Dakota that meets the definition of a minor source under the Administrative Rules of South Dakota (ARSD) 74:36:01:01(38) is required to obtain a minor air quality permit. Persona's potential volatile organic compound emissions are greater than 25 tons per year. Therefore, a minor air quality operating permit would be required.

7.2 State Emission Limits

Persona does not operate any processes that are subject to the state's particulate or sulfur dioxide emission limits. However, each permitted unit is required to meet the 20 percent opacity limit as required in ARSD 74:36:12:01.

Persona does not have any units which use combustible fuel or process a material. Therefore, Persona is not subject to the state's particulate matter and/or sulfur dioxide emission limits.

7.3 Summary of Applicable Requirements

Any source operating in South Dakota that meets the requirements of ARSD 74:36:04:02 is required to obtain a minor air quality permit. Based on the facility's potential emissions, Persona is a minor source for volatile organic compounds because the potential emissions are greater than 25 tons per year but less than 100 tons per year. Persona is a minor source for hazardous air pollutants because the potential emissions are less than 10 tons per year for a single hazardous air pollutant and less than 25 tons per year for a combination of hazardous air pollutants. Therefore, Persona will be required to operate within the requirements stipulated in the following regulations under the minor permit program:

- ARSD 74:36:04 Operating Permits for Minor Sources;
- ARSD 74:36:12 Control of Visible Emissions.

8.0 RECOMMENDATION

Based on the information submitted in the air quality permit application, the department recommends conditional approval of a minor air quality operating permit for Persona's operations in Madison, South Dakota. Questions regarding this permit review should be directed to Ashley Brakke, Engineer I.